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ABSTRACT

This booklet was prepared in response to a demand from Air Force Officers returning to academic study after being out of school for several years. Its main purpose is to help returning veterans learn how to study. The guide is divided into three sections: (1) the "Reconnaissance-Read-Recall" (RRR) system of study, (2) concepts in "How We Learn," (3) and "Study Aids." The RRR system for study suggests that; (1) study time should be divided between reading and reflected thinking; (2) study time should be planned and performed systematically; and (3) RRR method is not time consuming, but provides an excellent avenue for learning. Further, the authors conclude that learning requires (1) a will to learn, (2) action, (3) attention, (4) organization, (5) understanding, and (6) review. Finally, under "study aids" the authors describe the proper techniques for underlining, note-taking, outlining, and listening. A step-by-step guide is provided in all three sections. (RK)

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Studying To Learn

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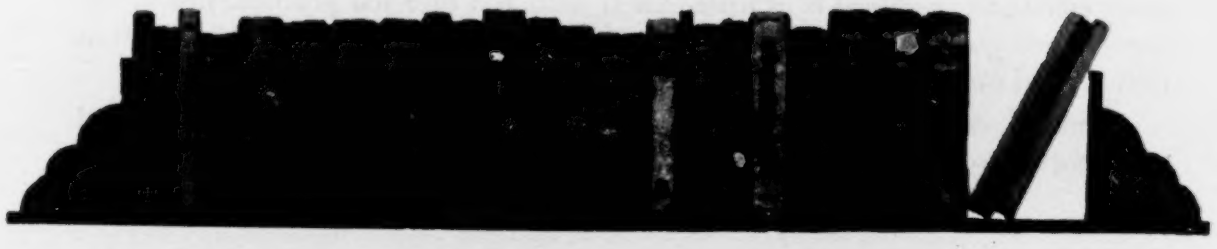

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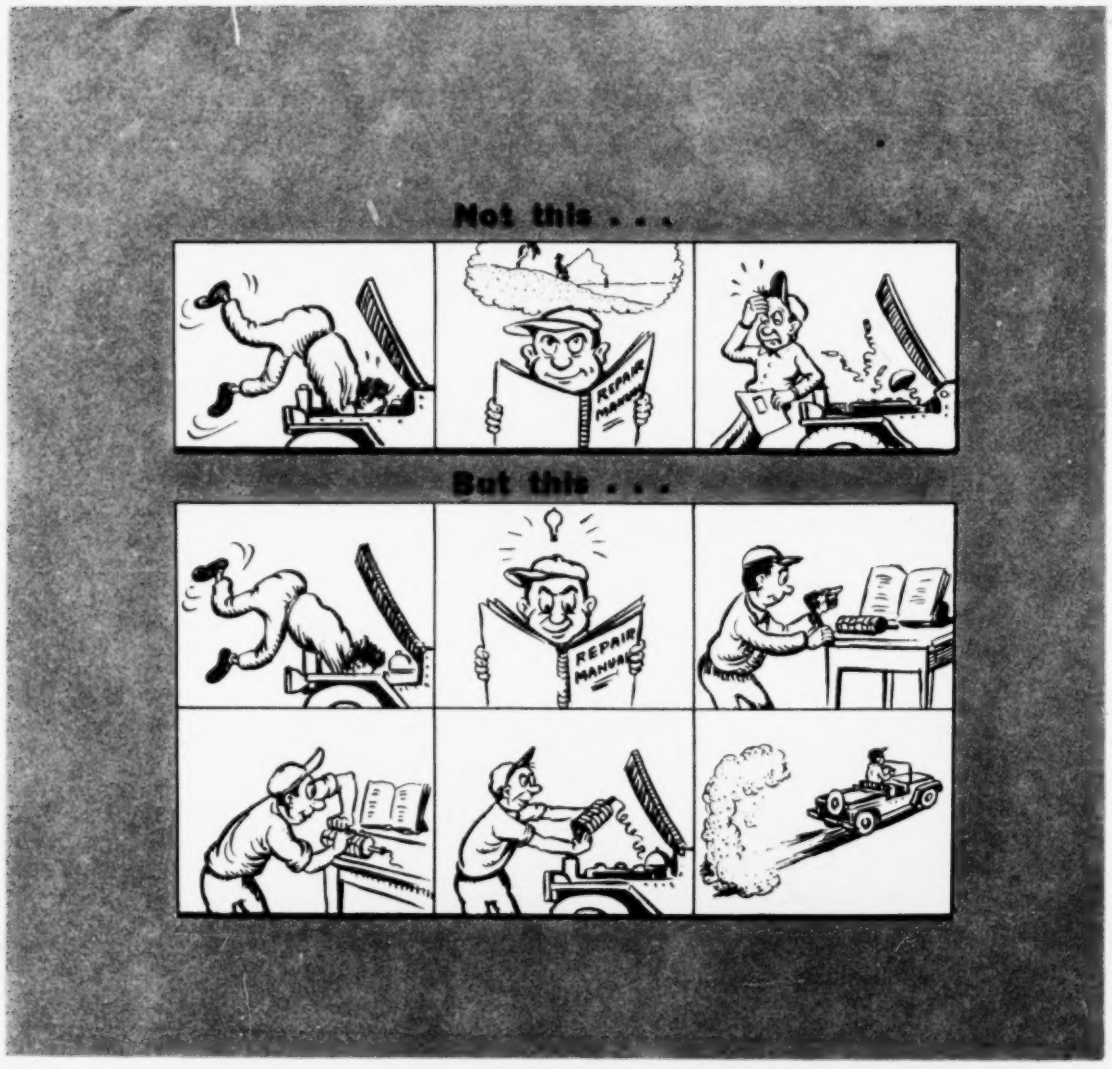

Reading isn't enough —
you have to practice what you read.

TO THE STUDENT:

This booklet was prepared in response to a demand from Air Force officers returning to academic study after being out of school for several years. When a number of them were asked if they had forgotten how to study, almost every one replied, "No . . . I never learned." This booklet was prepared to help them learn how to study.

Learning how to study is not very difficult if you know a few fundamental facts, keep a few key ideas in mind, and deliberately practice to improve yourself in areas that are important to efficient learning. Good study habits seldom develop accidentally. The person who has studied a great deal may still find his ability to study efficiently increased by a little expert help and directed practice, just as the experienced golfer may find his game improved by a little advice and instruction from a good professional.

Officers who are willing to work at using the study plans described here will see a real improvement in their study habits.

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This text is approved by Air University for use in resident courses. It reflects the current thought of the University and conforms as closely as possible with the doctrine of the Department of the Air Force. 1955. Reprinted December 1957.

Studying To Learn

Use a System — Chapter 1

Suppose you relax in your easy chair and read a book on how to play tennis, then go about your business the next few days without thinking again of what you have read until you are on a tennis court. Your tennis game will improve little, if any, as a result of your reading. Similarly, if you merely read this booklet, you will not learn how to study. This text is not simply informational material; instead, it describes procedures which must be practiced if they are to be mastered. You will not become efficient in study by reading it, but your efficiency will be increased if you study it, grasp the principles and procedures it outlines, and practice their application.

Efficient study of this booklet requires efficient reading, but few people read as efficiently as they can learn to. First of all, then, let us consider a method of learning through reading which, if followed, can greatly increase the reader's comprehension and retention. It is a method of covering reading assignments with a maximum of learning and memory for whatever amount of time is spent. A method alone is not enough, however. Really efficient study also requires some understanding of the psychological factors which promote learning. But let us examine the method first, and then practice it while learning other factors in effective study.

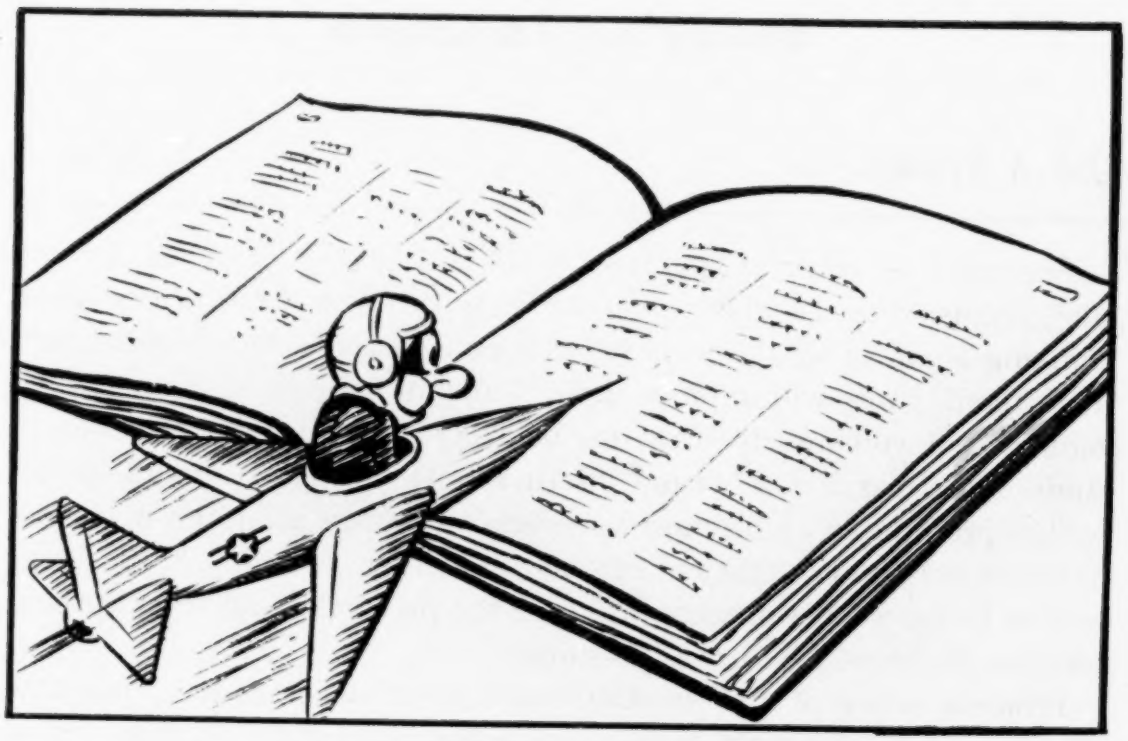
This method of study, consisting of three steps, has been devised to take full advantage of the psychological factors in the learning process.

In considering each of the steps we shall ask two fundamental questions: First, how is the step accomplished? Second, what good will result from the effective accomplishment of the step?

THE RECONNAISSANCE-READ-RECALL SYSTEM OF STUDY

As you know, a reconnaissance is a preliminary survey of a section to determine its general plan and nature, but not to get details. This is precisely the meaning and purpose of the *reconnaissance* step of the *Reconnaissance-Read-Recall* system of study.

Four methods may be used to accomplish the reconnaissance step. Many authors use topics and subtopics to break their material down



Reconnaissance.

into smaller, more easily recognized elements. Some authors use brief descriptive headings at the beginning of these topics to help the reader make the desired reconnaissance of the material.

If this aid to reconnaissance is not used, key sentences at the beginning or end of paragraphs may give the gist of the material. A quick survey will reveal whether this study aid is included; if so, it will serve the same purpose as that served by topic headings.

Other authors make a practice of summarizing at the end of a chapter or article the substance of the material covered. If this is done, it will prove an effective means for accomplishing the reconnaissance step. Read the summary first, with the idea of getting the general picture of the topic.

One of the first things to be learned in improving study is to use to the fullest extent every possible resource offered by the author. This does not always mean following the order of the text. If the author puts something at the end of a chapter which might be more useful to you if you read it first, by all means do so. This is recommended whenever the author includes a summary or study-directing questions.

If none of these study aids is offered, we are forced to depend upon the most difficult, but at the same time the most helpful, reconnaissance method: scanning. Scanning consists of running the eye rapidly down

a page, not reading word by word or even looking at every sentence but picking a sentence here and there to get a general idea of the subject and the author's approach to it. Developing the ability to scan rapidly and well requires some practice, but once achieved, this ability is a valuable aid in effective, intensive study, as well as in quick inspection of material to identify important ideas.

If you perform the reconnaissance step properly, you will see the general picture that the author developed in his article, and the main idea that he tried to present. You will see the organization of the subject, and this will enable you to spot the objective of the article and to work up the will to learn, which is so valuable in learning. It is like looking at the picture of a jigsaw puzzle before putting the pieces together. A view of the whole picture helps you see how each topic fits in with the other topics around it.

Immediately upon reading the title of the article, or as you begin the reconnaissance step, stop a moment and ask yourself: What material should be included under this title? Then throughout the reconnaissance step, formulate questions which you think might logically be answered in a later, detailed reading. For example, suppose your reading assignment includes an article entitled "Survival in the Arctic." From the title alone you may anticipate information which would

Question.

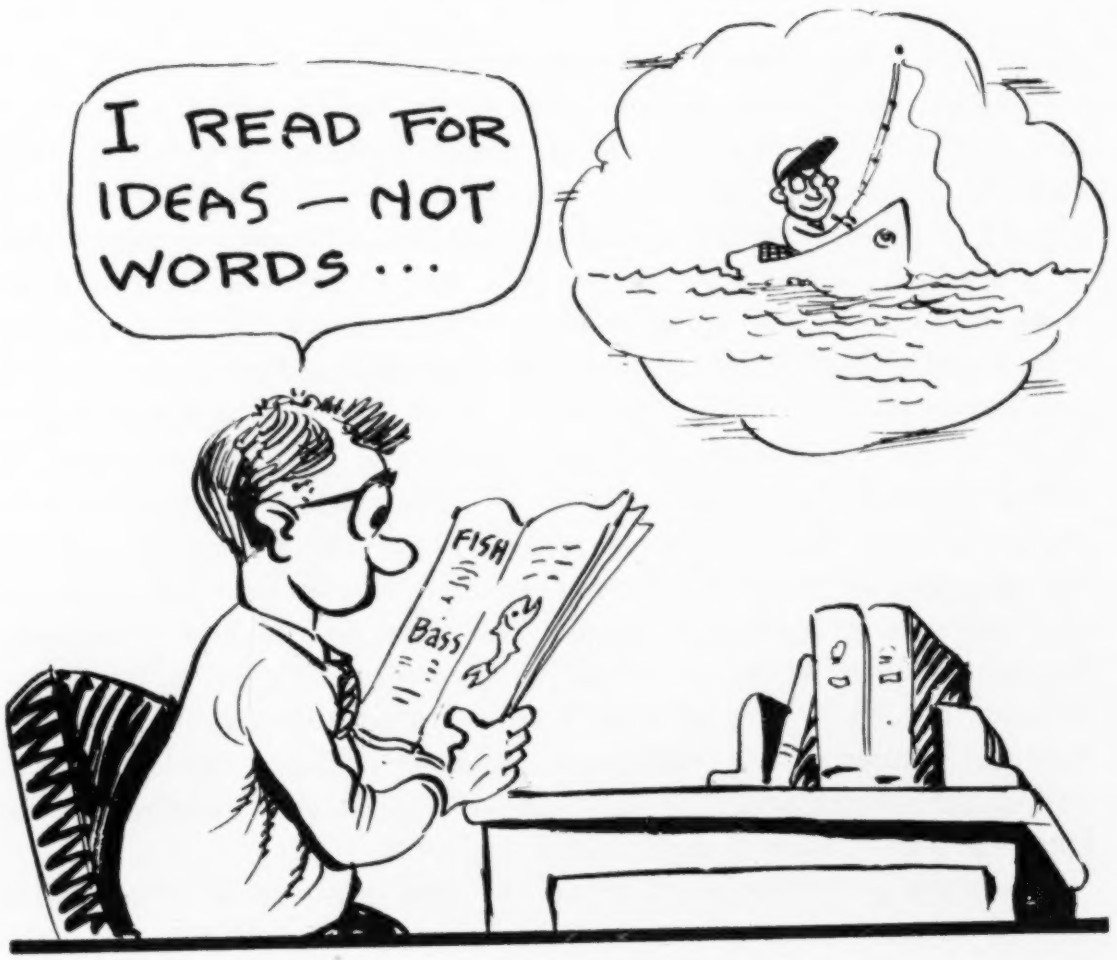
answer such questions as these: How can I get food in the arctic? How can I keep from freezing in the arctic? How should I proceed in attempting to get out of the arctic? How can I signal rescuers?

Under each of these questions you can develop various subquestions. Under the general subject of how to keep from freezing, for instance, you might ask these detailed questions: What can be used for fuel? How can I obtain fuel? What precautions should I observe in attempting to warm myself? How could I better my chances of survival if no fuel is to be found?

All these questions might be developed from the title alone. More detailed questions may occur to you during the reconnaissance step. Often, too, a list of questions will be found at the end of a chapter or reading assignment. It is a good idea to look for such questions first. Read them over and keep them in mind while you read the material in detail.

What results can you expect from this prequestioning? We have already mentioned the desirability of having objectives in study. The more specific your objectives are and the more clearly you are directed to the things you are to learn, the more effective your learning will be. These questions provide immediate objectives—not just an over-all idea of what you will gain by studying the whole article, but pointers telling you what to look for in each subtopic, sentence by sentence and paragraph by paragraph. They encourage you to look for specific facts rather than generalities. They encourage your undivided attention by giving you something to search for; thus they provide an immediate purpose in your study.

The second step in the *Reconnaissance-Read-Recall* method of study is *read*. Effective reading involves activity. When we begin to read a study assignment, most of us lean back in an easy chair, prop the book in our laps, and read with our eyes. Although our eyes are active—they read every word on the page—all too frequently our minds are relaxed. The result is that we read a paragraph word for word and then find that we have no idea of what we have read. The keystone of effective reading is action. Your mind is not thirsty soil that absorbs the water of knowledge without conscious effort. Knowledge is more like a football that has been kicked into the air, and must be pursued and caught. The extent to which your mind grapples with each point covered in your reading is the extent to which you learn what you are reading. All learning is an active process, and it takes place when the learner reacts energetically and aggressively to the material before him.



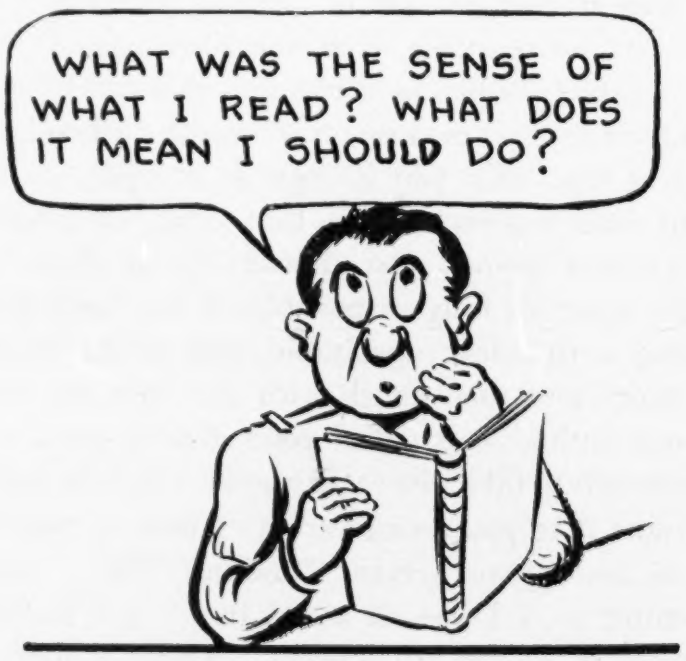
Read.

The third step in our method of study is *recall.* By this we mean rephrasing in your own words what you have read. When you finish reading a paragraph, a topic, or a chapter, lean back, look away from your book, and say in your own words what the author has been saying. In doing this, it may help you to look at a topic heading and then mentally recall what was included in that topic. Or if you have underlined the important points, you should reread these and mentally reconstruct the topics as fully as possible. If the book is not your own and underlining is therefore unsuitable, you might construct an outline from memory and then check with the book for accuracy. After completing your outline, it is still a good idea to see if you remember enough of the details to fill in the facts suggested by the outline.

It is important that you recall verbally; that is, actually speak the words aloud or under your breath. Thinking "Oh . . . ummmmmm . . . uh . . . I remember . . . I know all about that," just isn't good enough. We are all guilty of saying to ourselves, "That's a good idea, I know

all about it." But when we start to explain that idea to someone else, we find ourselves unable to put it into words. Any idea that is too vague to be explained in concrete, specific words is not likely to be of much value to anyone. As you know, you cannot talk intelligently about a subject or successfully use the material if you have only a vague idea of what it is about. After all, the only way to know whether a topic is clear enough in your mind to be expressed in words is to try putting it into words. In reconstructing a topic from your outline or from memory, put your ideas into actual words to be sure that you understand them. If you accomplish this step effectively, you are engaging in mental activity, which we have already discussed as an absolute prerequisite of learning. When you outline the author's material and put the substance of his article in your own words, you have achieved another essential of learning: organization. You do not know a subject thoroughly if you know every fact about it but still have only a vague idea of the significance of each fact in relation to the other subject matter. Organization of material is the answer. When you are able to outline the subject and reproduce topically the author's discussion, you know the organization that the author has used.

Thorough performance of the *recall* step does much to guarantee another of the essentials of learning: understanding. If you know the organization that the author follows and can express his ideas in your own words, you have mastered the material sufficiently to put it to



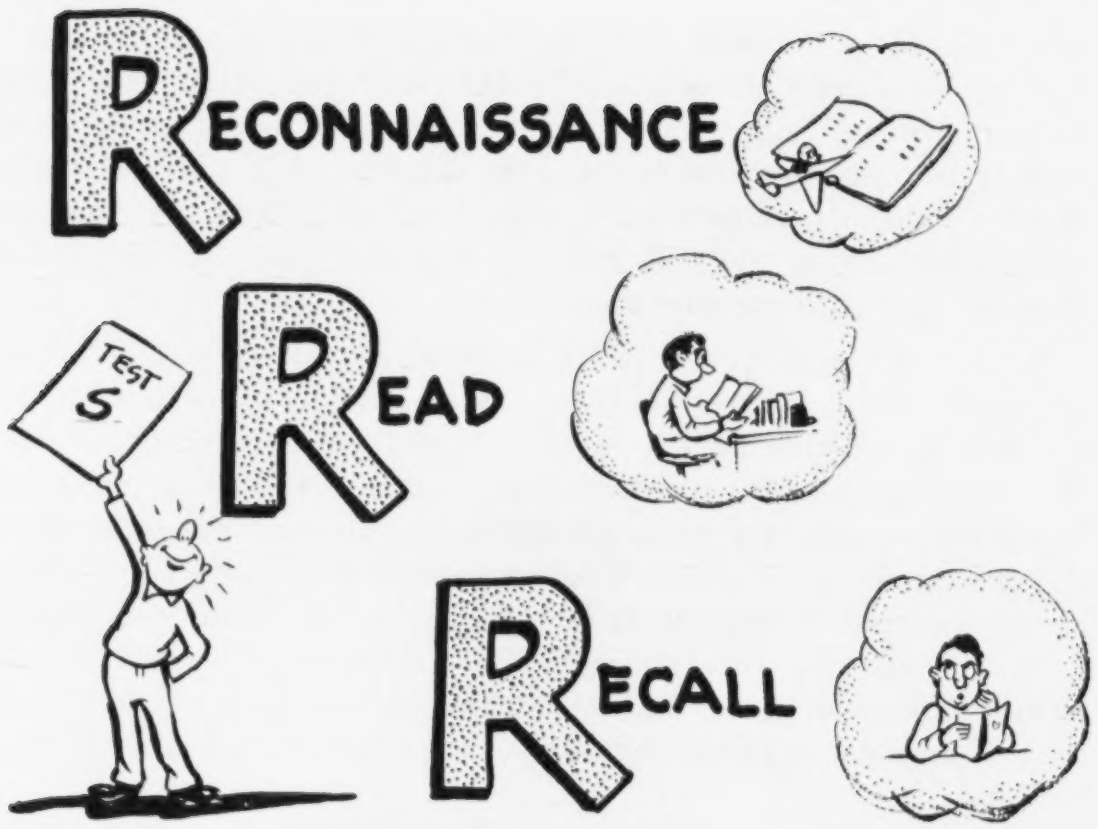
Recall.

use. You will profit from what you learn in proportion to the extent to which you apply it. You may be able to repeat certain facts from memory without understanding their import. For practical purposes, such facts are almost valueless. On the other hand, if you are able to express them in your own words and in such a manner that they are meaningful to you, you will probably be able to use your knowledge of the subject in appropriate situations.

Practice of the *recall* step will give you a ready, reliable, and helpful device for evaluating the effectiveness of your study to the present, for determining whether further study on a given topic is necessary, and for indicating areas in which additional study would be most profitable. It is often a waste of time to restudy thoroughly comprehended material or to study new material before assimilating the material you have already covered. If you can re-create a given topic from your outline notes, you know it well enough to proceed to something else. If you cannot, proceeding to new material at this point is likely to add to your store of unusable material and to consume much of your time without results.

The importance of the *recall* step can hardly be overemphasized. Actual laboratory experiments have shown that students who study a specified amount of time, whether fifteen minutes or five hours, generally make better test scores if they spend at least half their total study time in reflective thinking. That means if you have an hour to study a topic, you will do well to spend about thirty minutes in the *reconnaissance* and *reading* steps and at least thirty minutes in the *recall* step. Many experimenters recommend spending as much as two-thirds of study time in reflective thinking; hardly any recommend spending less than half.

It is easy to slight reflective thinking in your study period, because it is usually harder to think than to read. Furthermore, it is much easier to convince yourself that you have thought when you haven't really thought than to imagine that you have read when you haven't really read. It is a good idea to use your watch to insure that you do not slight reflective thinking in your study process. Laboratory tests have proved that if the student will spend at least half his study time in reflective thinking, he will be able to make better scores on tests, taken immediately after study or several weeks later, than if he spends all his time on the reading steps. If you are really interested in learning and remembering, give the *recall* step a fair chance.



Learn Your Three R's.

Summary

Every step of the *Reconnaissance-Read-Recall* method of study has been proved to be an indispensable link in a chain that leads to effective study. However, a system can't work miracles. It can't produce learning without expenditure of time and effort on the part of the student. If you are thinking that this system may be good but that it takes more time than you can spend in study and is too complicated to follow, remember three things:

1. Whatever the amount of your study time, if you will divide it between reading and reflective thinking, as described here, you will learn and remember more than if you omit the reflective thinking step.

2. Study performed at random intervals and in time fragments does not give as good results as study that is planned and performed systematically.

3. Most people who actually try the *Reconnaissance-Read-Recall* system of study report that it is much simpler and easier to put into effect than they had thought it would be. Don't assume that it is too difficult and time consuming for you. Give it a trial.

After a half-dozen practice tries, you will find that this method of study works very smoothly and simply, no matter how complex it may seem when you first use it. A little time spent now in developing skill in using it will pay big dividends later in time saved.

Chapter 2 How We Learn

Few people study efficiently. Most people think of learning as a process of absorption, an automatic result of reading or listening. They do not know that learning is a science, based on well-defined principles and axioms. Regardless of occupation or ability, the person who uses these principles effectively in study has a tremendous advantage over others who ignore them.

We study for one reason: to learn. Yet most people "study" to cover an assignment, to read a specified number of pages, or to put in a certain amount of time. All these aims are unimportant in themselves. The real aim of study should be to achieve a certain learning outcome, to acquire a new proficiency, skill, or understanding—not to turn a specified number of pages. Let us first ask ourselves these questions: What is learning? What are the results of learning?

Learning is the acquiring of new ways of doing things or satisfying desires. Notice the functional emphasis in this definition. We do not consider learning as the transmittal of facts from a book to the mind of the reader or from one person to another. We do not consider that a person is learning because facts are being stored in his mind. The expression "educated idiot" applies to the person whose mind is filled with isolated facts. Our definition of learning implies much more than this. A person learns to the extent that he can function properly and efficiently in his general work situation and in his life as a whole. He may acquire a great many facts, but unless he can use them in improving his adjustment to his work, to the social order in which he lives, and to his life in general, he has not "learned" anything.

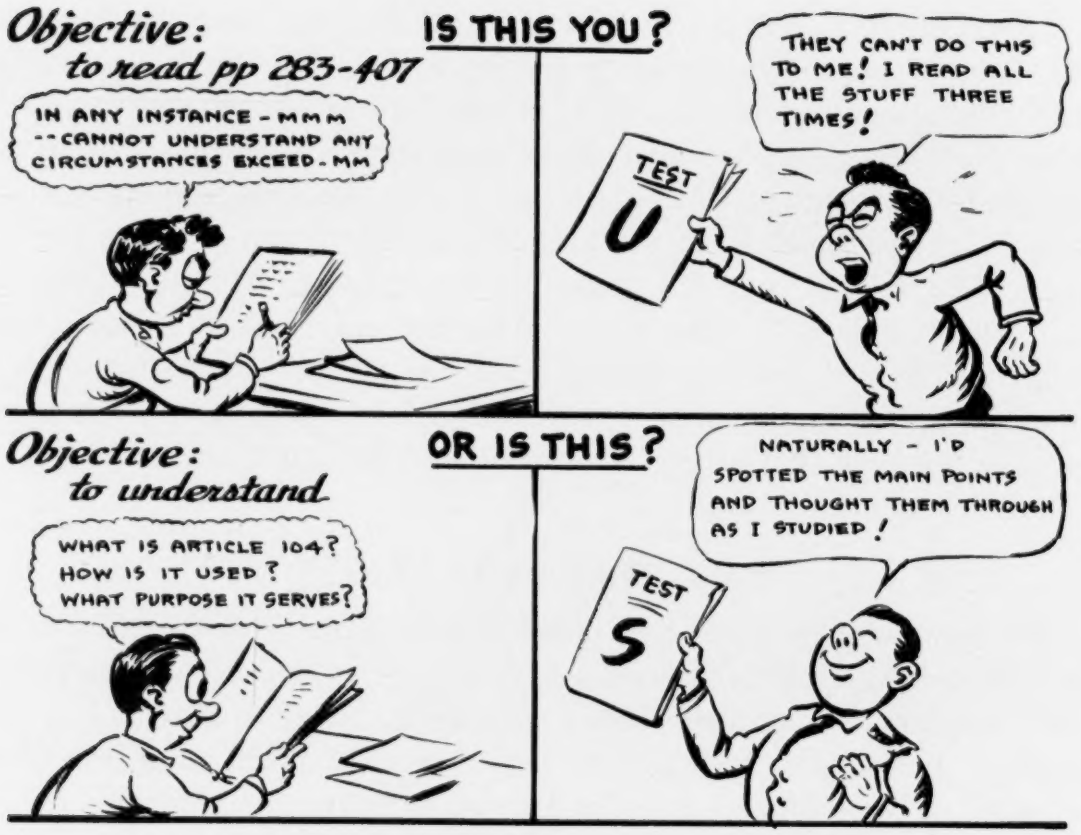
Efficient education emphasizes the functional aspect of learning. In the world of work or in society, a person is evaluated on the basis of what he can do, not what he knows. As far as you are concerned, then, learning must enable you to do something more efficiently and effectively. You can seldom learn how to do things better without learning facts. The learning of facts is usually essential to improved performance on the job. But learning a fact does not guarantee such improvement. To be most useful, facts must be learned in relation to something that you may do, and in such a way that you think about applying them in your work or in your social or cultural life.

Obviously, real learning in a professional school is necessary because it results in improved efficiency on the job. The material you study in a professional school has been selected because it can help you do your work better as a member of the profession. If you fail to see how the material included in a particular lesson can help you, the error may lie in your analysis of the assignment rather than in the material itself. The mass of material submitted for inclusion in a curriculum is critically examined by some planning agency, which works to eliminate whatever is not really pertinent. Do not lightly discard assigned material on the ground that it does not apply to you; instead, consider possible jobs which you may be given later in your career and try to relate this material to them.

PRINCIPLES IN LEARNING

We have said that learning does not take place in some mysterious and inexplicable fashion; neither is it a passive process of absorption that operates automatically when you are exposed to material to be learned. Learning is an active process that takes place according to a number of well-defined rules and principles. In the following paragraphs we shall consider six factors which, if they are used properly, will assist learning and which, if they are used improperly, will prevent it. They are (1) will to learn, (2) action, (3) attention, (4) organization, (5) understanding, and (6) review.

Will To Learn. The will to learn results from having a definite objective and recognizing the need to achieve that objective. A person is motivated to do a job when he knows exactly what he is expected to do and realizes why he must do it. The importance of a will to learn to effective learning can hardly be overemphasized. Contrast the amount of knowledge that you got from the average high school lecture with the amount that you got from a briefing on an important new job. You learned more from the job briefing chiefly because you were getting something that you were looking for and something that would affect your future well-being. Here you see the two factors that operate to produce good motivation. In order to gain the benefit expected from good motivation in your work, you should do two things for each period of instruction: First, determine clearly in your own mind what you must get from a period of study. Make your objectives definite. Don't say, "I must get an understanding of so-and-so." Determine exactly what you should bring away from the situation that you didn't have when you went into it. Second, answer the question,


Objective:
to read pp 283-407
IN ANY INSTANCE - MMM -- CANNOT UNDERSTAND ANY CIRCUMSTANCES EXCEED - MM
IS THIS YOU?
THEY CAN'T DO THIS TO ME! I READ ALL THE STUFF THREE TIMES!
TEST
U
Objective:
to understand
WHAT IS ARTICLE 104?
HOW IS IT USED?
WHAT PURPOSE IT SERVES?
OR IS THIS?
NATURALLY - I'D SPOTTED THE MAIN POINTS AND THOUGHT THEM THROUGH AS I STUDIED!
TEST
S

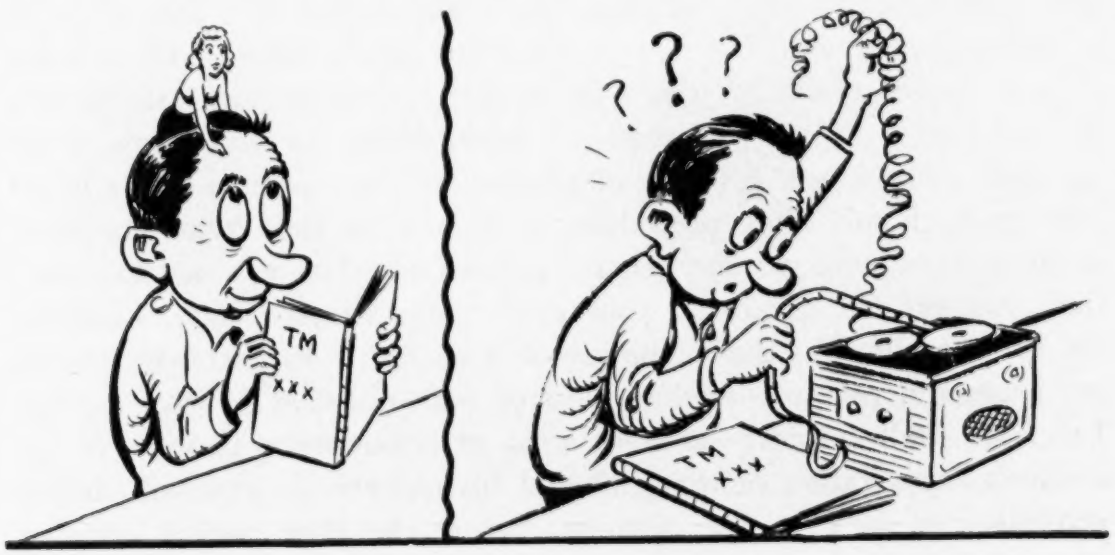
"How can this material help me in my future work?" The answer to the question is there if you will look for it. You are not motivated to study unless you can determine how the material will be of use to you. Always tie in study material as closely as possible with the work that you may be expected to do in your career, and evaluate it in relation to some position that you may fill.

Action. We have said that learning is an active process, not passive absorption. If you were like dry soil, effortlessly absorbing the water of knowledge as it is poured upon you, the Air Force would put you in situations where you could simply sit and be educated. But that is not possible. Your education, in the final analysis, depends entirely upon your participation in the learning situations which confront you. When you are faced with new ideas, facts, or principles you are in a "learning situation," and you learn as you react to, and participate in, that situation. Learning is in direct proportion to the amount of your reaction to a learning situation. When you listen to a lecture or read, it is easy to prop your feet on a chair, lean your head back, relax your mind and body, and let the flow of information come from the speaker to your ears, or from the book to your eyes. Unfortunately,

if only your ears or eyes are active, the information will stop with the active member. Only if you actively seek to catch and use the information will it be transmitted to your brain.

Anything that you can do to generate definite mental action while listening or reading will help you to achieve effective learning. One device is note-taking. If you reword what the speaker or author is saying in order to take notes, you will be mentally reacting to what you hear or see, and you will be learning. Note-taking is one of the best devices for insuring aggressive mental reaction to what your eyes and ears are taking in. And learning does not take place unless there is mental activity on the part of the listener or reader. You can follow a lecture by comparing the speaker's remarks with his outline, noting his elaboration of different points and thinking of possible improvements that you could make on his presentation. This keeps you mentally alert, which is the essence of learning. Another technique for insuring action is to ask yourself at the first of a period, "What should I get from this chapter or this lecture?" Formulate in your own mind several questions that you feel should be answered in the process of the discussion and look for the answers to those questions. This technique gives you something definite to accomplish as a result of your listening and reading and keeps your mind, as well as your eyes or ears, active in the process of learning.

Attention. The third factor in learning is attention, which means focusing the full power of your mind on the material that you wish to learn. When working with about 50-percent attention, you "take in" the material you hear or see, but it quickly fades from your mind and



is never used. If your attention lies between the halfway mark and total attention, you will be able to understand and remember the material you see or hear.

In order to concentrate effectively on learning, you should be motivated. You should feel some interest or curiosity concerning the material. Sometimes this is hard to do. But in your case there should be little material in which you cannot develop a genuine interest if you honestly try to relate it to your present work or future career. Interest usually comes as a result of knowledge. If you can begin to learn something about a subject, you will find your interest in it developing as your knowledge of it increases.

Mechanical factors, too, can help or hinder attention. First of all, your physical surroundings should not compete with your work for your attention. It's a sure bet which will win when the contest for your attention lies between principles of logic and pin-ups. Study in a room where there are as few distractions as possible. Remove maps showing you the way home, or souvenirs of a leave, or pictures of friends and family. Take one thing at a time; study when you are supposed to study.

Organization. You cannot learn a subject effectively simply by memorizing all the facts about it. Before you are able to use material that you have learned you must understand its organization, that is, how the parts fit together to make a complete picture. A lecturer has in mind a general pattern of information and ideas that he wants to get across to you. Unless you can recognize the general picture that he is trying to present, you will be lost in details. You know that it is much easier to fit together the pieces of a jigsaw puzzle if you have first seen the whole picture. The same is true in a lecture or in a reading assignment. If you can get the author's central idea and his general "plan of attack," you will be able to follow more intelligently his individual ideas and items of information. If you know what the end result of your listening or reading will be, you can better interpret each detail. This procedure is known as the "whole-to-part" method. First, you get the general pattern of what you are to learn; then you get the details in your more concentrated study. Studying reference outlines at the beginning of a course is an excellent way to get a general picture of what is to be accomplished in each period. Later we shall consider different ways of obtaining a preview of the author's organization of material and his objectives. You will find it profitable to spend a few moments before the class period scanning

the outline which the lecturer has prepared. You can then follow the discussion more easily and understand more clearly the material presented. In short, if you get a mental outline of the whole learning situation, you will be ready to learn more effectively the individual details as they come along. Details take on meaning as you see the relationship between them and other details, and between them and the situation as a whole. You must conscientiously try to tie in the details of the article or lecture with your predetermined picture of the subject.

Understanding. The fifth factor in learning is understanding. By this we mean getting the basic idea which the author or lecturer is trying to get across. You can do this by putting in your own words the author's or lecturer's statement. When you read or listen to material, you get the organization that the lecturer or author considered most logical in dealing with his subject—you get his organization. In order to put the material to best use, you must formulate in your mind the organization that makes most sense to you. This may or may not be the same as that used by the lecturer or the author.

You have had the experience of working on a problem, of groping blindly in the dark for a solution. Then suddenly, like a flash of light, you get an insight into the whole problem. You recognize the governing principle and grasp the essential idea. In looking over your lecture notes or in reading an assignment, do not stop when you have gone over the material. Keep working on it until you get the governing principle—the basic idea—as well as the individual facts in the situation. Only then will you be able to use it and remember it. The knowledge that you get from a course can be transferred into a work situation only to the extent that you comprehend the principles presented by the author or lecturer.

Review. Few experiences are so vivid that we learn them in one trial. Generally speaking, we must repeat any operation to make it our own. Material studied for an hour a day for four days, or even an hour a week for four weeks, will be remembered much better than material studied four hours one day and never reviewed. This is known as the "principle of distributed practice." You will find in your own case that some review will give you better comprehension and better memory than study concentrated at one time with no review.

Although repetition is essential to learning, repetition alone does not guarantee learning. You may go over material twenty-five times without really learning it. If repetition is to do you any good, you

must consider the principles of understanding, attention, action, organization, and will to learn. Only if you practice all these principles will repetition produce learning. Repetition does not necessarily consist of rereading. Probably the most effective type of review does not lie in rereading but in mentally working to recall the written material, referring to it only occasionally to check and supplement your memory. Review by recall is real work, but it results in better learning and memory than does rereading. You will not become an efficient learner by reading the principles of learning. Proficiency in their use comes only through comprehension and application.

REMEMBERING

Obviously, learning has no value unless it is retained. You have the mental ability to remember as much as is necessary, provided you use that ability effectively. There are three essentials in the effective use of memory. The first is *intention to remember*. Say to yourself, "Here is something I must remember—something that I will keep because it is necessary for me to remember it." That and that alone will enable the average person to double the efficiency of his memory. Most so-called forgetfulness or absent-mindedness is not due to an inability to remember but simply to a lack of effort. It is absurd to suppose that the professor who is a walking encyclopedia of technical knowledge cannot remember where he puts his pencil if he intends to remember that simple action. He fails to remember because he does not pay attention to what he is doing. He does not forget where he puts his pencil; he never really notices where he puts it in the first place. If you will

He Didn't Forget It—He Didn't Pay Enough Attention To Get It in the First Place!

make a conscious effort to file material in your mind for permanent reference, you will find that you can do a much better job of remembering than you thought possible.

The second essential to consider in remembering is *familiarity with material.* To put it simply: the more facts you can relate to a subject, the better you will remember that subject. For example, if you know not only the name of a man but the names of the members of his family, his occupation, and his general physical characteristics, you will be more likely to remember that man's name than if you know nothing about him except that his name is John Smith. By gathering and organizing a group of facts that support each other and that facilitate recall by association, you will remember them much better than if you try to remember each separately. You will be interested to note that this is another use of the factor of organization.

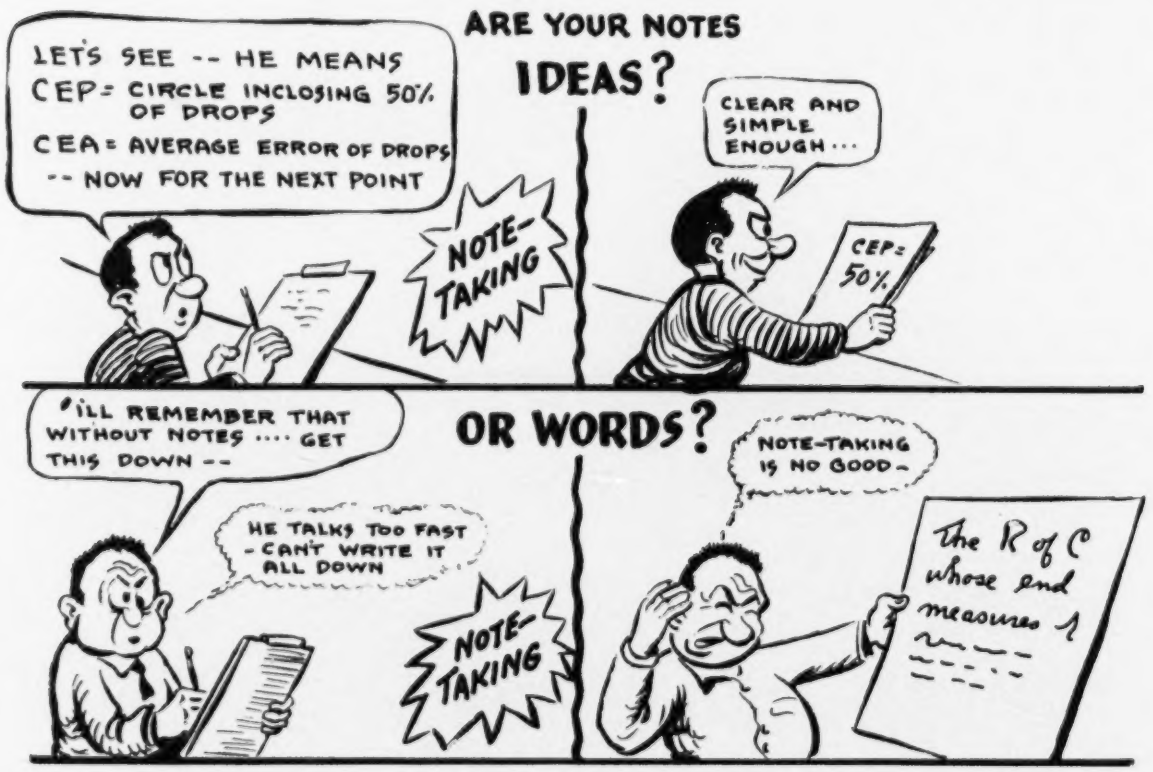
The third essential in remembering is *review.* You have to be reminded of things occasionally if you are to remember them. After repeated reminders, the memory does not "fade out" as quickly or as completely. Review is simply the repetition of material spaced at times when you particularly need to remember that material. What is true of repetition as an essential of effective learning also applies to review as an essential of memory.

Chapter 3 Study Aids

In the previous chapter we talked about some of the psychological principles to be observed in learning. Now we shall consider the tools that can help you apply those principles. The objective of this chapter, then, is to promote the effective use of learning tools.

Underlining. When you are reading in your own book and want to be able to review the material easily and efficiently, underlining is a convenient device. If you will watch closely for the sentences or phrases carrying the real ideas of the material, and underline them, you will not have to plough through detail when you review. Furthermore, you are reacting energetically—comprehending the author's organization and ideas—when you identify the key sentences in an article. This is a quick, easy way to focus your attention later in review.

Note-Taking. After you have listened to a class lecture or discussion, the only way to review what was said is to refer to the notes you took during that period. You must take systematic, meaningful, and understandable notes if you are to review effectively, using the factor of


ARE YOUR NOTES
IDEAS?
LET'S SEE -- HE MEANS
CEP= CIRCLE INCLOSING 50% OF DROPS
CEA= AVERAGE ERROR OF DROPS
-- NOW FOR THE NEXT POINT
NOTE-TAKING
CLEAR AND SIMPLE ENOUGH...
CEP= 50%
OR WORDS?
I'LL REMEMBER THAT WITHOUT NOTES.... GET THIS DOWN --
HE TALKS TOO FAST - CAN'T WRITE IT ALL DOWN
NOTE-TAKING
NOTE-TAKING IS NO GOOD -
The R of C whose end measures

repetition which we have discussed. In reading, of course, you can always go back to the material and reread it without taking notes. However, this requires much time and effort, especially if the material is in a library book or in some other source not immediately at hand. The minutes you spend taking notes as you read will be saved many times over when you review for tests. You are spared the trouble of searching out the original material for review and rereading it, page by page.

Five major rules should be observed in note-taking. First, look for the ideas of the speaker or writer, but express them in your own words. To go back to our principle of understanding, as you listen to a lecture or as you read an article, ask yourself: What is the idea underlying these words? Of course, you should note the facts you hear or read, but look a little further to see if the speaker or writer uses these facts to present a principle or idea. When you identify such an idea or principle, write it down in your own words. A device that will help you do this in reading is the *preview* step in our *Reconnaissance-Read-Recall* system of study. If the material is to be read, scan it to get a general picture of the whole article. Then as you read through it and take notes, you will see how the various parts tie together, and you will understand the organization that is followed.

Before listening to an important lecture, look over some library references dealing with the subject. Read them to get some idea of what the lecturer may cover in his discussion. Preparing your ordinary school assignment will often give you this background information. In short, get a picture of the material to be covered in the lecture period. If you already know how the parts fit together, you will be able to organize your notes intelligently as you take them during the lecture.

You have learned that note-taking is not a mechanical job of writing down the words you hear. It is a quick, thoughtful examination and analysis of statements. You note their meaning without attempting to record every word. Mastering the art of catching a speaker's or author's important ideas and recording them in your own words is probably the most valuable single aid to effective study and efficient learning that can be developed.

The second rule to observe in note-taking is this: be brief. A great many people begin with the best of intentions to take notes on a lecture but soon give up in disgust. They say, "By the time I write down one thing he has said, I've missed the next three. There's no way to go back and get them. What's the percentage in that?" The answer

is to be discriminating in your note-taking. Don't try to record everything that is said, but listen attentively and take notes on anything that gives promise of being important. Between important points, every good speaker allows space which he fills in with illustrations and discussion. In this way he gives his listeners time to "digest" one important point before he proceeds to another.

Third, record information rather than topics. Some students carefully list topic headings but fail to fill in necessary information about them. When listening to a lecture about the arctic, for example, it is easy to write under the heading "arctic," as the speaker identifies them, "definition," "characteristics," "problems," "resources," and "implications." This is a topical outline of the lecture on the arctic, but it contains no information. Bc sure that your notes are not just a list of headings or topics, without the real meat. Obviously you will not make this mistake if you record the speaker's ideas instead of topical words or phrases.

Fourth, organize your notes. Notes are of little value if they are thrown together helter-skelter, without showing how a major topic is broken down into subtopics or when one topic is dropped and another begun. In reviewing such notes, you see a mass of data without any apparent connection. Follow the speaker's pattern of thought and make clear in your notes the organization of his material. Under each main point, indent to show the various subpoints. Indicate where a topic is changed or where it is broken down into subtopics. To insure that your notes make sense, reorganize them soon after you take them. You should try to do this in the evening after the class, otherwise, after a few days you will probably not be able to make sense of your rough notes. Rework them to make them usable later. This is good review that will save you time in studying for tests.

All your notes on one topic should be kept together. Reserve a section of your notebook for each topic and keep your notes separated according to topic.

Fifth, take notes fairly constantly. This is not intended to contradict the rule of brevity, but many beginners in note-taking wait for the speaker to say something really inspiring and notable before making a note. This is not a good practice. Some speakers and authors organize their material so that it builds up to easily recognized major points. In many instances, however, it is only in looking back that the audience or reader can identify a fact or idea as an important one. Take notes steadily. Be brief in taking them, that is, use only necessary words, but

take notes steadily. Sometimes statements that seem trivial when you hear or read them later assume importance when you consider them together.

Outlining. Another tool of study is the outline. Let us consider that notes taken in a lecture or in reading represent a skeleton of the ideas presented by the author or lecturer. The pattern or organization of these ideas is logical and clear to the author or lecturer and, with study, it also becomes logical and clear to you. However, this organization is not necessarily the same that you yourself would use with that particular material. Change the organization of your notes if by doing so you can make it more logical and practical for your purposes. Fill in any abbreviations and gaps that you remember. Systematize your notes and work out the imperfections of organization and expression. When you have thus rearranged and reorganized your notes, you have made your own outline, which presents the material in a form that is most meaningful to you and most valuable for review or future reference.

Notes are good for review in spite of these disadvantages: they follow the author's ideas rather than your own, and they are filled with abbreviations and crudities of expression that you use in quick rephrasing of ideas. When you have outlined your notes, these disadvantages are eliminated. Further, you gain from having reviewed your material carefully in the process of outlining. You now have a clear, concise picture of the material.

The use of outlines for review has an important place in any student's study program. An outline permits quick self-examination on a subject. A glance at outline topic headings reminds you of a specific area in which you have studied. Without referring again to the outline, ask yourself, "What comes under this topic heading?" If you can reconstruct the material that should appear under the heading, you know that area and topic well enough to proceed to another subject. On the other hand, if you are not sure that you know the topic, the subtopics of your outline will show whether you have omitted anything and will give you additional information.

Notes are valuable in review work because they offer (1) a concise and easily grasped statement of the topic under consideration; (2) a method of self-examination to determine your inadequate areas; (3) a check list to determine whether you covered all areas in your mental recapitulation; and (4) a ready source of additional information when you cannot remember all the necessary facts about the topic heading.

Summarizing. The third learning tool is summarizing. The summary is a brief statement—sometimes a sentence, sometimes a paragraph—which gives the essential elements of the material covered in an article or lecture. It is a condensation of the ideas of the writer, a review of the facts. The summary is a valuable learning aid when used with general, nontechnical material that has been fully explained and discussed. In the case of highly complex and technical material, the summary is not adequate; instead, notes and outlines are needed. But where comparatively few ideas are presented and each idea is discussed at considerable length, you may summarize the article or lecture by stating and explaining the main ideas briefly.

Listening. Another learning tool is listening. In school probably more of your learning time is spent in listening than in any other way except reading. All the principles of the learning process discussed in the previous chapter also apply to listening. You must have a will to learn in order to listen effectively. You will not pay close attention to a lecturer unless you really want to learn what he is talking about. You must react. You cannot sit relaxed in body and mind and expect the lecturer's points to impress themselves on your brain. You have to be alert to learn. You may relax physically if at the same time your mind reacts with total attention to everything the lecturer is saying. Listening must be a thoroughly active process to be effective.

The necessity for attention is implied in our discussion of reaction. If you are to listen effectively and with understanding, you must give your undivided attention to the lecturer. "Listening with your ears" is a common method of sitting through a class, but you will not learn and retain subject matter unless your whole mind is focused on what you hear. It has been said that giving half attention to what is to be

A Lecturer's Words Mean Nothing If Your Brain Isn't Grinding Away.

learned is a waste of time. Remember this when you are listening; see that your concentration is on the important thing—the idea that the speaker is presenting and its possible use to you. Some listeners are distracted by the speaker's mannerisms or attitude or by other trivia. Of course a good speaker tries not to irritate his audience, but the good listener can ignore such distractions and concentrate on the subject instead.

Organization, as a principle of learning, is important in listening. Watch constantly for the speaker's organization of the subject. As you know, an understanding of the material studied is essential if it is to be used and retained. You must also listen with the idea of getting the key ideas presented by the lecturer.

The final principle in listening to learn is review. We have said earlier that the only way to review lecture material is to use the reference outline supplemented by your notes. However, you should bear in mind that repetition is as necessary here as in any other type of material. Suppose that you observe the principle of learning while you listen to a lecture. By what means can you increase your memory of the material presented? First, through intention to remember; second, through familiarity with the material involved (which includes grouping of related ideas and building up a knowledge of the material connected with the important points); and third, through review of notes. Remember, the key to effective listening is reacting aggressively to what you hear, rather than passively accepting it.

Studying at a Definite Time and Place. Now we shall consider some practical suggestions for the arrangement of your study schedule—a time-budgeting plan. First of all, each day set aside a few minutes or an hour as soon as possible after classes to review the material covered in the class periods. A large portion of what is ultimately lost is forgotten within 24 hours after being heard or read for the first time. If you will review at the end of your regular school day (or in any part of it that is free) that day's material before it has had time to fade from your mind, your memory for the material will be stepped up tremendously. Obviously it is easier to review and retain familiar material than to relearn material that you have forgotten.

Second, set aside a regular time for your other study, that is, your study in addition to your review. If you can arrange it, set aside the same time each day and study at that time. This will minimize the risk of letting the time slip by without having studied. We have all been guilty of intending to do a certain job but failing to get around

to it until it is too late. If you will establish a routine of studying at a certain time each day and schedule nothing else for that time, it is unlikely that you will miss your study because of poor management of time.

Third, have a definite place for studying. This doesn't mean that you can't study anywhere else. It does mean that whenever you have to study seriously, you should try to do it in this particular place. Since we have already discussed the importance of avoiding distractions, we shall review only briefly the characteristics of a good place to study. It is a place where conversation, the activities of friends, interesting noises, or reminders of things more pleasant than study do not compete with your work for your attention. Your desk should face a wall and have nothing on it except your work materials. Your chair may have a soft cushion but should not be luxurious enough to encourage you to take a nap.

Habit is a study aid. If you get the habit of going to a certain place at a certain time to study, you will find that you are beginning to concentrate more easily. You lose less time in warming up to your subject because you subconsciously assume the proper frame of mind for study when you enter that particular place at the regular time. When this becomes a habit you have made real progress, because then you go through your study routine with less effort. You will find not only

Studying?

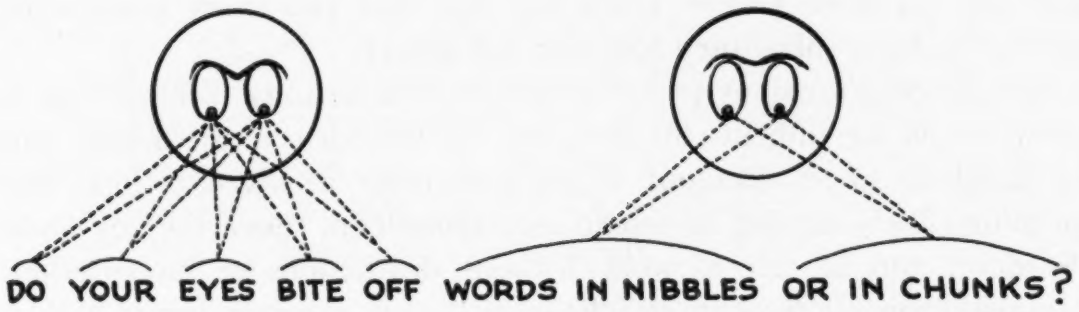
that you get started more easily but also that you study more effectively. You have substituted habit for will power.

One veteran, anxious to force himself into a study routine that he knew would be difficult for him, hit on the idea of arranging with his landlady to let him out of his apartment at seven o'clock each morning. Each evening he would lock himself in, shove the key under the door, and be left to work without distractions or interruptions. You will probably not care to follow this heroic example, but it enabled the veteran to pull himself out of the academic doldrums. Of course, this experiment carried to the ultimate degree the policy of a definite time and place for study!

Reading at a Faster Rate. A great many people feel that they are handicapped in their study because of their low rate of reading. Some merely bemoan their hard luck in being slow readers, and others try to learn to read faster. Those who try will find that they can step up their reading rate with very little trouble and without sacrificing comprehension.

There are commercial reading courses that report gains of from 35 percent to 200 percent in reading speed in as little as 20 hours' laboratory time distributed over six or eight weeks. Without exaggeration it can be said that most reading improvement courses will actually enable the average person to read at least a third faster and to remember as much of what he reads as before. What is not generally known, however, is that a determined student, willing to make a real effort, can achieve excellent results in improving his reading rate without any outside help at all.

In any attempt to improve reading speed, we should first recognize one important fact: Most of us do not read as fast as we can, or even as fast as we can comprehend. Just as we do not usually walk as fast as we can but choose instead a gait that is easy and restful, in the same way we read at a pace that is easy rather than efficient. Because this is true, the average student can increase his rate of reading from one-fifth to one-third simply by sitting up alertly, concentrating on the material to be read, and pushing along as fast as he can. We have all read faster many times when we were eager to learn the contents of an important message. The laboratory reading course is designed to make this pattern of reading a habit. There are ingenious mechanical devices to encourage you to speed up your reading and to keep it fast, but you can do about as well in your own room if you work at it and exert your will power.



Choose one of your assignments and time yourself as you read five pages at your usual rate. The next day take another five pages and see how fast you can drive yourself through it and still comprehend what you are reading. Force your eyes to take in big gulps of a line and to move rapidly from one gulp to the next, instead of taking leisurely sips. At the same time, force your mind to dig away at the subject with the idea of taking in everything that the author is saying. Reading faster requires teamwork between your body and your brain. Your eyes and your whole body posture must be geared to intensive physical reaction. Your mind has to work steadily to catch the material as fast as it is covered, rather than passively absorbing it. Even with the first trial, you will find that you are reading faster than in the past, without sacrificing comprehension and memory.

Record your time for the second day's reading and check your improvement. Next day repeat the process, still timing yourself, and note your improvement. About the fourth or fifth day apply the same method to another of your reading subjects. Check yourself occasionally to see if your mind is taking in what your eyes are covering. You will be surprised at the difference this makes in how much you remember. As a matter of fact, most people find that they remember more after improving their reading rate 30 percent than they did before. This is true because under their old method of study their minds were loafing even more than their eyes.

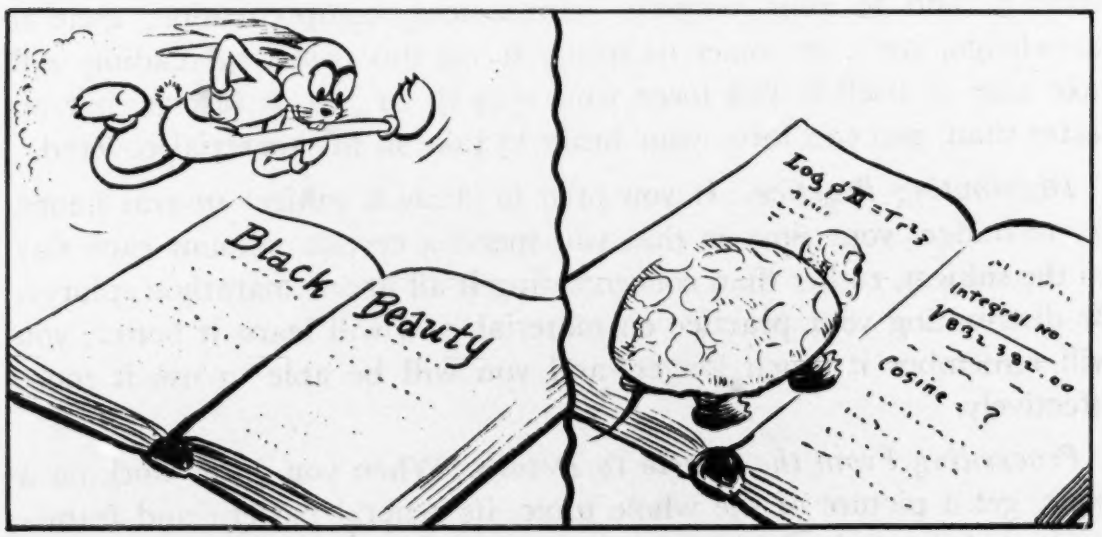
The gains that you make in reading speed (and perhaps in comprehension as well) are likely to be both quick and spectacular when you start the time-comparison routine we have just described. The important thing, however, is to continue this vigorous approach to reading until it becomes a habit. It is easy to pick up reading speed through conscious effort alone, but unless you practice regularly enough and over a long enough period of time you will tend to fall back into your old leisurely habits. At this point the reading laboratory has its

greatest avantage. It sets up conditions in which you are strongly motivated to read at your fastest possible rate, without having to depend on will power to force your maximum effort. In the laboratory you keep going at this pace until you become accustomed to it, until it becomes your normal way of reading. You have then formed the habit of speed reading. Furthermore, as you continue to exercise this speed-up approach to reading, your rate will increase and tend to become permanent.

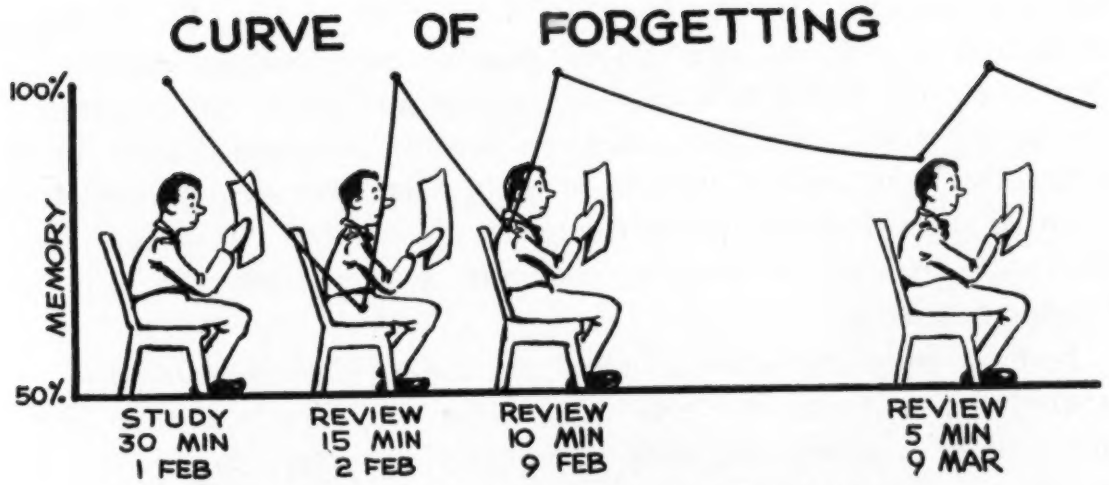
Perhaps you don't want to read any faster; perhaps you prefer a leisurely pace. If you have time to get what you want from your reading without speeding up, there is probably no good reason why you should try to improve your rate. On the other hand, if you feel that you need to read faster, you can. You can improve your reading rate within a short time if you are willing to force yourself to read as fast as you can in most of your reading.

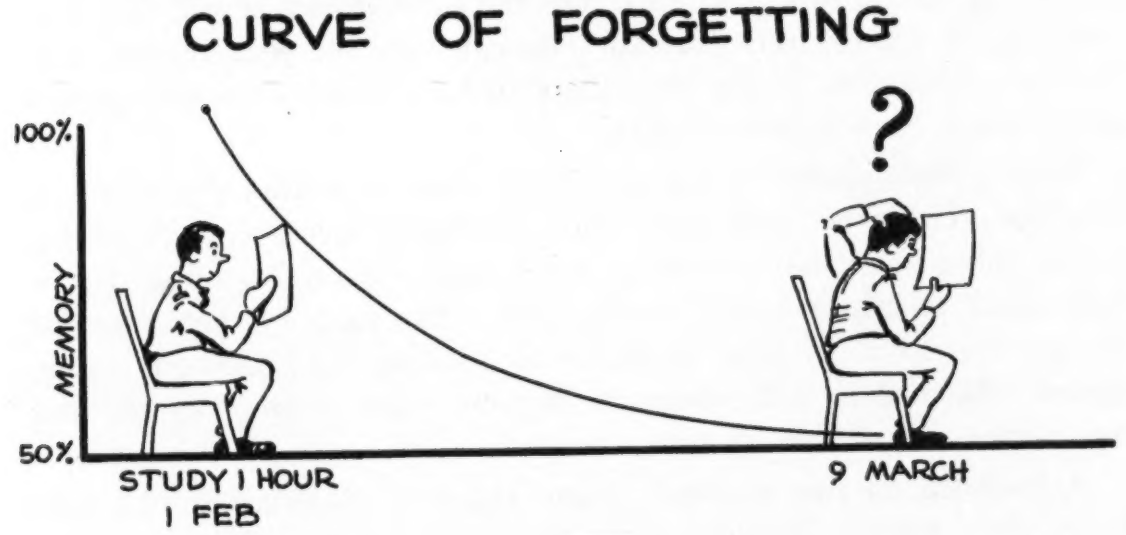
Some people prefer to use novels or other recreational reading to develop their speed, and apply their increased speed to their assignments only after it has become a habit in recreational reading. If you don't want to improve your reading rate while studying, you may still be able to do so in your recreational reading. And if you'd rather spend dollars than will power to improve your reading speed, look around for a reading laboratory!

A final tip on fast reading: Some types of material can be read faster than others. Difficult, complex material cannot be read effectively at as fast a rate as simple, recreational material. Efficient reading



Some Types of Material Can Be Read Faster Than Others.





requires that you vary your speed of reading to the difficulty of the material and to your purpose (amusement, comprehension, general knowledge, etc.). It comes naturally to do this. Efficient reading will take care of itself if you force your eyes to go just as fast as, but no faster than, you can force your brain to take in the material covered.

Distributing Practice. If you plan to study a subject several hours, try to budget your time so that you spend a certain amount each day on the subject, rather than concentrating it all in one marathon splurge. By distributing your practice on material, you will learn it better, you will remember it much longer, and you will be able to use it more effectively.

Proceeding From the Whole to Details. When you go to work on a topic, get a picture of the whole topic, its general pattern and framework, and the author's objectives and plan of organization. After doing this, proceed to work for the individual details.

Reinforcing Memory. Forgetting takes place most rapidly within a short time after you stop studying, then gradually slows down. Arrange your first review to take place within a few hours after the material is studied; the second, about a week later; and the final review, about three weeks later. You will find that distribution of practice is the most useful review schedule because it insures maximum retention of the material that you have studied and are reviewing. Perhaps you won't have time to use this system in reviewing all your study material, but if you will carefully select the material that is especially important for you to remember and review it according to this schedule, you will probably retain as much of it as you need.

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